J-2 ENGINE

1
00:00:21,349 --> 00:00:18,400
[Music]

2
00:00:23,689 --> 00:00:21,359
Saturn five quarterly film report number

3
00:00:29,570 --> 00:00:23,699
ten covers progress during the period

4
00:00:32,120 --> 00:00:29,580
March April May 1965 development

5
00:00:34,490 --> 00:00:32,130
manufacturing and testing of s1c stage

6
00:00:36,350 --> 00:00:34,500
components by the Boeing Company and the

7
00:00:41,270 --> 00:00:36,360
Marshall Center continued throughout the

8
00:00:44,569 --> 00:00:41,280
quarter following installation of the s1

9
00:00:47,170 --> 00:00:44,579
CT static firing stage on March 1st in

10
00:00:49,490 --> 00:00:47,180
Marshalls new s1c static test and

11
00:00:51,470 --> 00:00:49,500
structural load testing of the vehicle's

12
00:00:55,639 --> 00:00:51,480
thrust structure was successfully

13
00:00:59,150 --> 00:00:55,649

performed propellant load testing of the

14
00:01:03,049 --> 00:00:59,160
s1 CT was then conducted in preparation

15
00:01:05,600 --> 00:01:03,059
for its initial firing installation of

16
00:01:08,090 --> 00:01:05,610
the stages 5 F 1 engines completed on

17
00:01:18,950 --> 00:01:08,100
March 30th was accomplished in three

18
00:01:21,499 --> 00:01:18,960
days on April 10th approximately two

19
00:01:24,200 --> 00:01:21,509
months ahead of schedule a 16 second

20
00:01:26,480 --> 00:01:24,210
static test of the s1 CT center engine

21
00:01:28,850 --> 00:01:26,490
was successfully conducted with no major

22
00:01:30,499 --> 00:01:28,860
problems encountered two attempts on the

23
00:01:34,969 --> 00:01:30,509
previous day had failed to meet test

24
00:01:36,620 --> 00:01:34,979
requirements after an analysis of

25
00:01:39,289 --> 00:01:36,630
performance data from the single engine

26
00:01:51,240 --> 00:01:39,299
firing a decision was made to test all

27
00:01:57,640 --> 00:01:55,360
on April 16th a Saturn 5 program major

28
00:02:00,460 --> 00:01:57,650
milestone was attained with a fully

29
00:02:03,100 --> 00:02:00,470
successful 5 engine static firing for a

30
00:02:04,570 --> 00:02:03,110
duration of 6 and a half seconds total

31
00:02:09,550 --> 00:02:04,580
thrust of seven and a half million

32
00:02:11,260 --> 00:02:09,560
pounds was developed over 1,000

33
00:02:13,150 --> 00:02:11,270
measurements of the s-1 cetys

34
00:02:15,850 --> 00:02:13,160
performance were made and recorded in

35
00:02:29,800 --> 00:02:15,860
the blockhouse located some 800 feet

36
00:02:32,740 --> 00:02:29,810
from the test stand a second successful

37
00:02:36,430 --> 00:02:32,750
5 engine firing was held on May 6th this

38
00:02:38,259 --> 00:02:36,440

time for 15 seconds on May 20th a 40

39
00:02:40,300 --> 00:02:38,269
second test was conducted during which

40
00:02:42,790 --> 00:02:40,310
the 4 outboard engines were gimballed

41
00:02:45,130 --> 00:02:42,800
early next quarter a one and a half

42
00:02:46,840 --> 00:02:45,140
minute test is scheduled and then a two

43
00:02:52,449 --> 00:02:46,850
and a half minute or full duration

44
00:02:54,310 --> 00:02:52,459
static firing in Marshalls log test our

45
00:02:56,410 --> 00:02:54,320
testing of the fuel tank thrust

46
00:02:59,080 --> 00:02:56,420
structure assembly for the s1 CS

47
00:03:01,569 --> 00:02:59,090
structural test stage was begun this

48
00:03:04,000 --> 00:03:01,579
quarter the tests performed to date have

49
00:03:08,890 --> 00:03:04,010
been successful testing will continue

50
00:03:11,380 --> 00:03:08,900
for the next several months the s-1 CS

51
00:03:13,840 --> 00:03:11,390
LOX tank was completed March 11th and

52
00:03:18,729 --> 00:03:13,850
placed in storage for future structural

53
00:03:20,890 --> 00:03:18,739
testing Assembly of s1 c1 the first

54
00:03:23,289 --> 00:03:20,900
flight stage moved steadily toward

55
00:03:25,240 --> 00:03:23,299
completion after the fuel tank and

56
00:03:27,190 --> 00:03:25,250
thrust structure were mated in the VAB

57
00:03:29,650 --> 00:03:27,200
the unit was transferred to the

58
00:03:31,720 --> 00:03:29,660
horizontal assembly area following

59
00:03:34,289 --> 00:03:31,730
completion of the inter tank locks tank

60
00:03:36,670 --> 00:03:34,299
forward skirt assembly slated for June

61
00:03:41,440 --> 00:03:36,680
horizontal mating of the two units will

62
00:03:44,229 --> 00:03:41,450
be accomplished fabrication and assembly

63
00:03:46,390 --> 00:03:44,239

of s1 sea to the second flight stage

64
00:03:48,940 --> 00:03:46,400
included completion and mating of the

65
00:03:53,650 --> 00:03:48,950
fuel tank halves plus completion of LOX

66
00:03:55,900 --> 00:03:53,660
tank bulkheads at Marshall's Mishu

67
00:03:57,850 --> 00:03:55,910
operations in New Orleans the Boeing

68
00:04:01,360 --> 00:03:57,860
Company continued with its assembly of

69
00:04:02,960 --> 00:04:01,370
the dynamic test stage s1 CD the first s

70
00:04:06,440 --> 00:04:02,970
1c stage to be my

71
00:04:08,810 --> 00:04:06,450
there in March the s1c be thrust

72
00:04:12,970 --> 00:04:08,820
structure was installed in misuse newly

73
00:04:17,720 --> 00:04:15,170
following completion of fuel tank

74
00:04:20,330 --> 00:04:17,730
hydrostatic testing vertical assembly of

75
00:04:22,280 --> 00:04:20,340
the s1 CD continued with stacking of the

76
00:04:27,200 --> 00:04:22,290
fuel tank and the inner tank on the

77
00:04:29,330 --> 00:04:27,210
thrust structure the for helium bottles

78
00:04:34,550 --> 00:04:29,340
for pressurizing the fuel tank were

79
00:04:36,980 --> 00:04:34,560
installed in the LOX tank in April the

80
00:04:39,380 --> 00:04:36,990
LOX tank was assembled on April 18th in

81
00:04:44,630 --> 00:04:39,390
the Bab with mating of the lower and

82
00:04:47,510 --> 00:04:44,640
upper halves during the quarter boeing

83
00:04:50,060 --> 00:04:47,520
continued work on s1 CF facilities

84
00:04:53,120 --> 00:04:50,070
checkout stage and began assembly of s1

85
00:04:59,150 --> 00:04:53,130
c2 the first flight stage to be built at

86
00:05:01,520 --> 00:04:59,160
Mishu with initial bulkhead welding atma

87
00:05:03,050 --> 00:05:01,530
shoes new stage test facility computer

88
00:05:05,360 --> 00:05:03,060

and telemetry equipment have been

89
00:05:07,070 --> 00:05:05,370
installed in the support section the

90
00:05:09,680 --> 00:05:07,080
equipment will be used to obtain and

91
00:05:12,409 --> 00:05:09,690
evaluate information from the various s1

92
00:05:22,550 --> 00:05:12,419
c systems being tested under simulated

93
00:05:25,400 --> 00:05:22,560
flight conditions the first s2 stage

94
00:05:27,860 --> 00:05:25,410
five engine cluster ignition test was

95
00:05:31,159 --> 00:05:27,870
successfully conducted on April 24th at

96
00:05:33,469 --> 00:05:31,169
Santa Susana field laboratory the five

97
00:05:35,960 --> 00:05:33,479
second Test consisted of Battleship LH

98
00:05:37,870 --> 00:05:35,970
to tank preconditioning loading of

99
00:05:39,980 --> 00:05:37,880
propellants to prescribed levels

100
00:05:42,469 --> 00:05:39,990
preconditioning of engines and related

101
00:05:44,420 --> 00:05:42,479
systems and performing the engine start

102
00:05:47,390 --> 00:05:44,430
sequence through the ignition phase a

103
00:05:49,730 --> 00:05:47,400
prime test objective was verification of

104
00:05:52,670 --> 00:05:49,740
the proper sequence of j2 engine cluster

105
00:05:56,870 --> 00:05:52,680
operation all test objectives were

106
00:05:58,880 --> 00:05:56,880
successfully achieved on may 1st a 10

107
00:06:00,830 --> 00:05:58,890
second cluster main stage test was

108
00:06:02,860 --> 00:06:00,840
attempted but was terminated prematurely

109
00:06:04,960 --> 00:06:02,870
after one second

110
00:06:06,520 --> 00:06:04,970
an ignition detected signal was not

111
00:06:17,770 --> 00:06:06,530
received from the number three engine

112
00:06:20,170 --> 00:06:17,780
and cut off occurred automatically on

113
00:06:22,420 --> 00:06:20,180

May 7th at Santa Susana are completely

114
00:06:24,520 --> 00:06:22,430
successful 10 second cluster firing of

115
00:06:26,680 --> 00:06:24,530
the 5j two engines of the battleship

116
00:06:29,560 --> 00:06:26,690
stage marked the attainment of a major

117
00:06:32,380 --> 00:06:29,570
program milestone by the s2 prime

118
00:06:35,140 --> 00:06:32,390
contractor North American Aviation space

119
00:06:37,300 --> 00:06:35,150
and information systems division test

120
00:06:39,790 --> 00:06:37,310
objectives included preconditioning of

121
00:06:45,100 --> 00:06:39,800
the battleship LH to tank the engines

122
00:06:47,860 --> 00:06:45,110
and related systems structural testing

123
00:06:50,890 --> 00:06:47,870
of the s2 SD structural test dynamic

124
00:06:53,200 --> 00:06:50,900
test stage got underway on March 22nd

125
00:06:55,570 --> 00:06:53,210
with engine thrust load tests on the

126
00:06:58,060 --> 00:06:55,580
thrust structure upon completion of this

127
00:07:03,760 --> 00:06:58,070
series of tests body load tests will be

128
00:07:06,910 --> 00:07:03,770
conducted at SN IDS seal Beach facility

129
00:07:09,070 --> 00:07:06,920
the s2 common bulkhead test tank was

130
00:07:11,140 --> 00:07:09,080
successfully Hydra status today March

131
00:07:13,270 --> 00:07:11,150
and returned to the vertical Assembly

132
00:07:16,990 --> 00:07:13,280
Building where assembly was completed on

133
00:07:19,330 --> 00:07:17,000
May 26th the CB TT was then shipped to

134
00:07:25,090 --> 00:07:19,340
SATA Sena where the test program is

135
00:07:27,160 --> 00:07:25,100
scheduled to begin next quarter a major

136
00:07:29,110 --> 00:07:27,170
milestone was reached with completion of

137
00:07:30,850 --> 00:07:29,120
structural build-up of the all system

138
00:07:33,300 --> 00:07:30,860

stage at the seal Beach vertical

139
00:07:35,560 --> 00:07:33,310
Assembly Building on May 26th

140
00:07:38,110 --> 00:07:35,570
high-pressure pneumatic testing of the

141
00:07:40,330 --> 00:07:38,120
LH 2 and lox tanks was completed next

142
00:07:46,240 --> 00:07:40,340
day and the stage was transferred to

143
00:07:48,550 --> 00:07:46,250
station 2 for systems installation the

144
00:07:50,620 --> 00:07:48,560
s2f thrust structure this quarter became

145
00:07:52,800 --> 00:07:50,630
the first completed major sub assembly

146
00:07:55,450 --> 00:07:52,810
for the facilities check out stage

147
00:08:00,160 --> 00:07:55,460
structural assembly was begun on April

148
00:08:03,490 --> 00:08:00,170
5th fabrication and assembly of the

149
00:08:05,650 --> 00:08:03,500
first s to flight stage s21 continued

150
00:08:08,500 --> 00:08:05,660
this quarter with the initial insulation

151
00:08:12,970 --> 00:08:08,510
bonding operation on LH to tank cylinder

152
00:08:15,670 --> 00:08:12,980
number for fabrication of the common

153
00:08:16,450 --> 00:08:15,680
bulkhead and assembly of the quarter

154
00:08:21,010 --> 00:08:16,460
panels for the

155
00:08:23,110 --> 00:08:21,020
thrush structure in Essen ID's

156
00:08:25,900 --> 00:08:23,120
electromechanical mock-up control room

157
00:08:27,279 --> 00:08:25,910
at Donnie s two-stage automatic checkout

158
00:08:30,430 --> 00:08:27,289
equipment installation is now complete

159
00:08:33,399 --> 00:08:30,440
and stage and GSA integration is being

160
00:08:35,769 --> 00:08:33,409
accomplished gse and stage integration

161
00:08:41,019 --> 00:08:35,779
in the local control mode was completed

162
00:08:42,820 --> 00:08:41,029
on April 29th development testing of the

163
00:08:45,280 --> 00:08:42,830

eight solid propellant illage rocket

164
00:08:47,769 --> 00:08:45,290
motors which will be mounted on the s2

165
00:08:49,930 --> 00:08:47,779
inter stage structure is underway at

166
00:08:53,019 --> 00:08:49,940
rocket dines McGregor Texas facility

167
00:08:55,090 --> 00:08:53,029
during Saturn five flights these motors

168
00:08:58,150 --> 00:08:55,100
will be fired simultaneously at the

169
00:09:08,350 --> 00:08:58,160
instant the s1c stages engines are shut

170
00:09:10,389 --> 00:09:08,360
down the s4b facilities checkout stage

171
00:09:12,790 --> 00:09:10,399
which was installed in beta test and

172
00:09:14,949 --> 00:09:12,800
number three at Douglas Aircraft Company

173
00:09:17,380 --> 00:09:14,959
Sacramento test facility late last

174
00:09:19,510 --> 00:09:17,390
quarter underwent successful propellant

175
00:09:21,970 --> 00:09:19,520
loading tests in both manual and

176
00:09:24,160 --> 00:09:21,980
semi-automatic modes during this report

177
00:09:26,230 --> 00:09:24,170
period it was the first loading of

178
00:09:28,960 --> 00:09:26,240
cryogenic propellants into a flight type

179
00:09:31,600 --> 00:09:28,970
s4b with more than a hundred tons of

180
00:09:35,050 --> 00:09:31,610
liquid hydrogen at minus 423 degrees

181
00:09:37,410 --> 00:09:35,060
Fahrenheit and liquid oxygen at 297

182
00:09:39,880 --> 00:09:37,420
degrees being pumped into the stage

183
00:09:42,220 --> 00:09:39,890
workability of tests and equipment and

184
00:09:55,249 --> 00:09:42,230
compatibility of stage and stand were

185
00:10:01,139 --> 00:09:58,649
also at Sacto the s4b battleship test

186
00:10:03,839 --> 00:10:01,149
program continued this quarter in beta

187
00:10:06,449 --> 00:10:03,849
test and number one with a completion of

188
00:10:08,819 --> 00:10:06,459

Saturn 1b development firings in mid-may

189
00:10:11,579 --> 00:10:08,829
the battleship stage is being equipped

190
00:10:14,339 --> 00:10:11,589
with a Saturn 5 configuration j2 engine

191
00:10:18,869 --> 00:10:14,349
and Saturn 5 testing will begin next

192
00:10:20,519 --> 00:10:18,879
quarter construction of the vertical

193
00:10:22,379 --> 00:10:20,529
checkout lab progressed during the

194
00:10:25,919 --> 00:10:22,389
report period with erection of

195
00:10:27,839 --> 00:10:25,929
structural steel being accomplished at

196
00:10:29,999 --> 00:10:27,849
Douglass's huntington beach plant

197
00:10:33,719 --> 00:10:30,009
joining of the liquid oxygen and liquid

198
00:10:36,119 --> 00:10:33,729
hydrogen tanks for the s4 be 501 the

199
00:10:37,529 --> 00:10:36,129
first Saturn 5 flight stage was

200
00:10:42,239 --> 00:10:37,539
completed and the stage was

201
00:10:43,889 --> 00:10:42,249
hydrostatically tested the stage was

202
00:10:45,389 --> 00:10:43,899
then moved into the cleaning tower for

203
00:10:46,949 --> 00:10:45,399
cleaning operations prior to

204
00:10:50,969 --> 00:10:46,959
installation of propellant tank

205
00:10:54,779 --> 00:10:50,979
insulation fabrication and assembly of

206
00:10:58,969 --> 00:10:54,789
components for s4b 502 the second Saturn

207
00:11:00,779 --> 00:10:58,979
5 flight stage moved steadily ahead

208
00:11:02,759 --> 00:11:00,789
qualification testing of stage

209
00:11:07,559 --> 00:11:02,769
components such as this umbilical

210
00:11:09,599 --> 00:11:07,569
disconnect continued at santa monica at

211
00:11:12,029 --> 00:11:09,609
air researches test facility in phoenix

212
00:11:14,129 --> 00:11:12,039
arizona qualification testing of the

213
00:11:19,139 --> 00:11:14,139

fuel feed duct was conducted by the

214
00:11:20,969 --> 00:11:19,149
douglas subcontractor structural testing

215
00:11:23,489 --> 00:11:20,979
such as this LOX tank water pressure

216
00:11:27,199 --> 00:11:23,499
test was also underway at Douglass's

217
00:11:29,729 --> 00:11:27,209
space system center at huntington beach

218
00:11:31,379 --> 00:11:29,739
at the marshall center the first j2

219
00:11:33,659 --> 00:11:31,389
engine to be delivered there by

220
00:11:36,269 --> 00:11:33,669
Rocketdyne was installed in the newly

221
00:11:39,119 --> 00:11:36,279
completed s4 be battleship test and in

222
00:11:41,699 --> 00:11:39,129
April initial static firings will be for

223
00:11:53,730 --> 00:11:41,709
the Saturn 1b program the stand will be

224
00:12:00,460 --> 00:11:57,790
as part of its f1 engine casting quality

225
00:12:02,680 --> 00:12:00,470
control program Rocketdyne is now

226
00:12:04,780 --> 00:12:02,690
employing the high-energy x-ray service

227
00:12:08,110 --> 00:12:04,790
of the Southern California Cancer Center

228
00:12:09,880 --> 00:12:08,120
the 2 million volt x-ray machine used

229
00:12:12,070 --> 00:12:09,890
for cancer diagnosis and treatment

230
00:12:14,470 --> 00:12:12,080
during the day is utilized in the

231
00:12:17,590 --> 00:12:14,480
evening for radiography of f1 engine

232
00:12:19,360 --> 00:12:17,600
cast components high-energy x-ray

233
00:12:21,820 --> 00:12:19,370
inspection has several advantages over

234
00:12:24,310 --> 00:12:21,830
conventional methods including deep

235
00:12:26,620 --> 00:12:24,320
penetration of up to 12 inches of steel

236
00:12:29,710 --> 00:12:26,630
equivalent greater scope of penetration

237
00:12:33,420 --> 00:12:29,720
and a sensitivity which permits 1%

238
00:12:36,160 --> 00:12:33,430

difference in metal density to be read

239
00:12:37,870 --> 00:12:36,170
by the end of April thermal insulation

240
00:12:40,269 --> 00:12:37,880
had been installed on engine number

241
00:12:43,060 --> 00:12:40,279
fourteen - one at edwards field

242
00:12:45,460 --> 00:12:43,070
laboratory extended hold tests were then

243
00:12:46,810 --> 00:12:45,470
conducted by dropping locks and fuel to

244
00:12:49,060 --> 00:12:46,820
the main propellant valves and

245
00:12:51,370 --> 00:12:49,070
monitoring ambient air temperatures and

246
00:12:56,350 --> 00:12:51,380
component skin temperatures inside the

247
00:12:58,060 --> 00:12:56,360
cocoon several fabricated electrical

248
00:13:00,250 --> 00:12:58,070
interface panels were built and tested

249
00:13:02,590 --> 00:13:00,260
during the quarter these panels are

250
00:13:07,660 --> 00:13:02,600
constructed of machined parts and formed

251
00:13:09,310 --> 00:13:07,670
sheet metal parts bolted together the

252
00:13:11,829 --> 00:13:09,320
testing procedure was similar to that

253
00:13:14,470 --> 00:13:11,839
used on the cast version preliminary

254
00:13:16,389 --> 00:13:14,480
analysis of test data indicates that the

255
00:13:20,460 --> 00:13:16,399
fabricated panel is structurally

256
00:13:22,930 --> 00:13:20,470
adequate for maximum flight loads a

257
00:13:24,910 --> 00:13:22,940
teardown display for engineering

258
00:13:27,280 --> 00:13:24,920
examination and inspection of engine

259
00:13:29,500 --> 00:13:27,290
number two double O six at rocket deines

260
00:13:31,120 --> 00:13:29,510
Canoga Park plant marked formal

261
00:13:34,090 --> 00:13:31,130
completion of the flight rating test

262
00:13:36,850 --> 00:13:34,100
phase of the f1 program the engine had

263
00:13:41,920 --> 00:13:36,860

been static fired in the frt calibration

264
00:13:44,920 --> 00:13:41,930
series at edwards at the marshall center

265
00:13:46,990 --> 00:13:44,930
the first f1 engine for the first s1 c

266
00:13:49,630 --> 00:13:47,000
flight stage was delivered by Rocketdyne

267
00:13:57,190 --> 00:13:49,640
in March and is now undergoing minor

268
00:14:02,330 --> 00:14:00,650
the first j2 engine liquid oxygen turbo

269
00:14:04,520 --> 00:14:02,340
pumped to be assembled at rocket dines

270
00:14:06,890 --> 00:14:04,530
Neosho Missouri plant was completed in

271
00:14:09,740 --> 00:14:06,900
March transfer of this component

272
00:14:11,360 --> 00:14:09,750
fabrication operation to Neosho was made

273
00:14:13,400 --> 00:14:11,370
to take advantage of manufacturing

274
00:14:15,560 --> 00:14:13,410
facilities there and to relieve the

275
00:14:17,450 --> 00:14:15,570
workload in the turbomachinery area at

276
00:14:21,560 --> 00:14:17,460
rocket deines Canoga Park California

277
00:14:23,990 --> 00:14:21,570
plant after calibration of the Neosho

278
00:14:26,600 --> 00:14:24,000
facility's newly operational balancing

279
00:14:28,910 --> 00:14:26,610
machine temporary balancing of the j2

280
00:14:31,880 --> 00:14:28,920
locks impeller was accomplished using

281
00:14:33,710 --> 00:14:31,890
beeswax weights metal is later removed

282
00:14:35,660 --> 00:14:33,720
from the impeller it points opposite to

283
00:14:41,120 --> 00:14:35,670
the weights to produce a balanced

284
00:14:43,580 --> 00:14:41,130
component the last of five j2 engines

285
00:14:45,860 --> 00:14:43,590
for various phases of the s4b battleship

286
00:14:48,590 --> 00:14:45,870
test program was delivered to Douglas

287
00:14:50,450 --> 00:14:48,600
Sacramento on May 1st this engine which

288
00:14:52,880 --> 00:14:50,460

is of the saturn v flight vehicle

289
00:15:01,640 --> 00:14:52,890
configuration possesses a restart

290
00:15:03,680 --> 00:15:01,650
capability a total of six successful

291
00:15:05,960 --> 00:15:03,690
malfunction tests were performed at

292
00:15:07,910 --> 00:15:05,970
Santa Susana this quarter as part of

293
00:15:10,490 --> 00:15:07,920
requirements for the j2 flight rating

294
00:15:12,440 --> 00:15:10,500
test program the engine was deliberately

295
00:15:14,840 --> 00:15:12,450
fired with various malfunctions to

296
00:15:17,210 --> 00:15:14,850
determine the effect on performance and

297
00:15:24,110 --> 00:15:17,220
a/c of a site shutdown could be

298
00:15:30,000 --> 00:15:27,600
frt engine number 202 3 was acceptance

299
00:15:32,579 --> 00:15:30,010
tested and the formal frt program was

300
00:15:34,319 --> 00:15:32,589
begun in May following electrical and

301
00:15:35,250 --> 00:15:34,329
mechanical check out of the engine on

302
00:15:44,750 --> 00:15:35,260
the stand

303
00:15:50,129 --> 00:15:47,610
vertical test and 3a which is equipped

304
00:15:52,079 --> 00:15:50,139
to simulate altitude conditions was

305
00:15:54,210 --> 00:15:52,089
reactivated with this initial static

306
00:16:03,780 --> 00:15:54,220
firing in March after completion of

307
00:16:05,189 --> 00:16:03,790
modifications assembly continued at

308
00:16:08,550 --> 00:16:05,199
Marshall on the flight systems

309
00:16:12,000 --> 00:16:08,560
instrument unit 500 FS this is the first

310
00:16:13,759 --> 00:16:12,010
Saturn 5 iu in which all instrumentation

311
00:16:16,259 --> 00:16:13,769
will be actual working hardware

312
00:16:19,110 --> 00:16:16,269
meanwhile the facilities checkout unit

313
00:16:21,780 --> 00:16:19,120

500 F is in storage and will be shipped

314
00:16:24,060 --> 00:16:21,790
to Cape Kennedy in August structural

315
00:16:26,939 --> 00:16:24,070
fabrication of the Saturn 5 vibration

316
00:16:29,189 --> 00:16:26,949
test unit 500 V is virtually complete

317
00:16:32,100 --> 00:16:29,199
and component assembly will be finished

318
00:16:36,150 --> 00:16:32,110
next quarter assembly of the Saturn 5 iu

319
00:16:39,079 --> 00:16:36,160
breadboard test unit SIU 500 ST is

320
00:16:45,600 --> 00:16:43,470
SIU 200 500 s a structural test unit

321
00:16:48,689 --> 00:16:45,610
common to both the Saturn 1b and 5

322
00:16:51,059 --> 00:16:48,699
programs was installed atop an s4 B

323
00:16:54,360 --> 00:16:51,069
forward skirt for structural testing

324
00:16:58,259 --> 00:16:54,370
which got underway May 27th a second IU

325
00:17:00,750 --> 00:16:58,269
structure designated SIU 200 500 s to

326
00:17:03,120 --> 00:17:00,760
using segments manufactured by North

327
00:17:05,850 --> 00:17:03,130
American Aviation will be assembled by

328
00:17:09,600 --> 00:17:05,860
IBM and tested to qualify the structures

329
00:17:15,329 --> 00:17:09,610
for Saturn 5 I use and SIU 203 and

330
00:17:17,909 --> 00:17:15,339
subsequent the first s2 124 m stabilized

331
00:17:20,069 --> 00:17:17,919
platform for the IU was delivered to

332
00:17:22,319 --> 00:17:20,079
Marshall by the manufacturer Bendix

333
00:17:28,439 --> 00:17:22,329
corporation in March and is undergoing

334
00:17:30,440 --> 00:17:28,449
checkout by MSF C personnel the first

335
00:17:33,450 --> 00:17:30,450
aerospace systems test & Evaluation

336
00:17:35,730 --> 00:17:33,460
console known as ass tech for laboratory

337
00:17:35,940 --> 00:17:35,740
check out of the IU digital computer and

338
00:17:38,550 --> 00:17:35,950

day

339
00:17:41,850 --> 00:17:38,560
Durr was also delivered to Marshall by

340
00:17:43,140 --> 00:17:41,860
IBM or Wigga New York a significant

341
00:17:45,270 --> 00:17:43,150
development milestone

342
00:17:47,130 --> 00:17:45,280
this marked successful completion of an

343
00:17:48,960 --> 00:17:47,140
overall system's marriage of the launch

344
00:17:54,680 --> 00:17:48,970
vehicle digital computer and data

345
00:17:58,980 --> 00:17:56,850
checkout of the integrated automatic

346
00:18:01,380 --> 00:17:58,990
checkout telemetry ground station was

347
00:18:04,050 --> 00:18:01,390
performed by IBM Huntsville during the

348
00:18:05,880 --> 00:18:04,060
report period this system is capable of

349
00:18:08,010 --> 00:18:05,890
receiving recording processing and

350
00:18:10,200 --> 00:18:08,020
analyzing data transmitted by the

351
00:18:15,180 --> 00:18:10,210
various telemetry links of the Saturn

352
00:18:18,150 --> 00:18:15,190
vehicles and IU's milling of the

353
00:18:20,970 --> 00:18:18,160
mounting frame for the IU's st 124 M

354
00:18:26,730 --> 00:18:20,980
stabilized platform was also performed

355
00:18:28,950 --> 00:18:26,740
by IBM this quarter at the Huntsville

356
00:18:31,320 --> 00:18:28,960
facility work began in April on building

357
00:18:34,260 --> 00:18:31,330
number 5 to be used for administrative

358
00:18:35,940 --> 00:18:34,270
and engineering offices IBM this quarter

359
00:18:38,550 --> 00:18:35,950
was awarded a contract for integration

360
00:18:40,830 --> 00:18:38,560
and check out of IU's in addition to its

361
00:18:51,060 --> 00:18:40,840
previous responsibility for design and

362
00:18:53,580 --> 00:18:51,070
manufacturing the first of 24 ground

363
00:18:55,980 --> 00:18:53,590

computer systems from RCA data Systems

364
00:18:58,200 --> 00:18:55,990
Division Van Nuys California has been

365
00:19:01,440 --> 00:18:58,210
delivered to the Marshall Center the

366
00:19:03,660 --> 00:19:01,450
system known as the RCA 110a was

367
00:19:05,760 --> 00:19:03,670
installed in Marshalls s1c stage

368
00:19:08,100 --> 00:19:05,770
check-out facility which is now in

369
00:19:12,680 --> 00:19:08,110
process of buildup Boeing Company

370
00:19:17,430 --> 00:19:15,120
Marshalls new Saturn 5 system

371
00:19:19,830 --> 00:19:17,440
development facility also known as the

372
00:19:21,780 --> 00:19:19,840
Saturn 5 breadboard began to take shape

373
00:19:24,480 --> 00:19:21,790
late in the quarter with initial

374
00:19:27,900 --> 00:19:24,490
installation of equipment including 110a

375
00:19:30,090 --> 00:19:27,910
computers from RCA and a digital command

376
00:19:33,330 --> 00:19:30,100
system from radiation incorporated at

377
00:19:35,610 --> 00:19:33,340
Palm Bay Florida the Saturn 5 breadboard

378
00:19:37,830 --> 00:19:35,620
being built up in Marshalls quality and

379
00:19:43,290 --> 00:19:37,840
reliability assurance lab will be

380
00:19:45,240 --> 00:19:43,300
operated by Boeing upon completion the

381
00:19:48,210 --> 00:19:45,250
Saturn 5 breadboard will appear like

382
00:19:49,650 --> 00:19:48,220
this tabletop scale model in addition to

383
00:19:51,720 --> 00:19:49,660
various staged simulation of

384
00:19:55,020 --> 00:19:51,730
Whitman the facility will contain such

385
00:19:58,950 --> 00:19:55,030
vehicle hardware as an f1 engine s4b

386
00:20:01,380 --> 00:19:58,960
stage aft section with j2 engine and s4

387
00:20:10,680 --> 00:20:01,390
be forward skirt with instrument unit

388
00:20:13,050 --> 00:20:10,690

attached at Marshall's Mississippi test

389
00:20:14,940 --> 00:20:13,060
facility construction progressed

390
00:20:18,270 --> 00:20:14,950
steadily this quarter on the test

391
00:20:21,240 --> 00:20:18,280
complexes to s2 stage static test stands

392
00:20:24,420 --> 00:20:21,250
and the dual position s1 c stage static

393
00:20:26,760 --> 00:20:24,430
test stand as well as on the associated

394
00:20:29,280 --> 00:20:26,770
facilities in mt F's laboratory and

395
00:20:34,410 --> 00:20:29,290
engineering complex and support services

396
00:20:36,990 --> 00:20:34,420
complex an activation task force was

397
00:20:39,090 --> 00:20:37,000
also at work at MTF to help provide an

398
00:20:41,280 --> 00:20:39,100
orderly transition from construction and

399
00:20:43,800 --> 00:20:41,290
equipment installation to operational

400
00:20:48,930 --> 00:20:43,810
capability as various facilities are

401
00:20:51,720 --> 00:20:48,940
completed delivery of the s2 stages for

402
00:20:54,360 --> 00:20:51,730
testing at MTF has been rescheduled with

403
00:20:56,700 --> 00:20:54,370
the s2 t all systems due to be the first

404
00:21:00,120 --> 00:20:56,710
instead of the facilities checkout stage

405
00:21:02,250 --> 00:21:00,130
the s2 t a multi-purpose ground test

406
00:21:04,650 --> 00:21:02,260
stage slated for delivery in september

407
00:21:06,810 --> 00:21:04,660
will allow a full duration static firing

408
00:21:09,660 --> 00:21:06,820
capability providing additional data

409
00:21:12,060 --> 00:21:09,670
prior to firing s21 the change also

410
00:21:14,700 --> 00:21:12,070
allows more expeditious use of s2 t

411
00:21:20,580 --> 00:21:14,710
ground support equipment relieving an s

412
00:21:24,330 --> 00:21:20,590
and ID manufacturing problem in summary

413
00:21:26,370 --> 00:21:24,340

March April and May 1965 witnessed

414
00:21:28,140 --> 00:21:26,380
substantial achievement along a diverse

415
00:21:30,300 --> 00:21:28,150
front with ground support equipment

416
00:21:33,840 --> 00:21:30,310
being integrated into the program in

417
00:21:35,970 --> 00:21:33,850
increasing volume various ground tests

418
00:21:39,300 --> 00:21:35,980
instrument units in final stages of

419
00:21:41,840 --> 00:21:39,310
completion continuing advances in engine

420
00:21:44,580 --> 00:21:41,850
development testing and production

421
00:21:47,010 --> 00:21:44,590
successful s4 B stage propellant loading

422
00:21:49,110 --> 00:21:47,020
tests and continuing flight stage

423
00:21:51,960 --> 00:21:49,120
assembly operations

424
00:21:55,040 --> 00:21:51,970
a successful five engine cluster static

425
00:21:57,660 --> 00:21:55,050
firing of the s2 battleship stage

426
00:22:00,870 --> 00:21:57,670
including phases of assembly work on the

427
00:22:03,750 --> 00:22:00,880
first s1c flight stage and the